

**ANEURYSM OF THE THORACIC AORTA: ITS INCIDENCE,
DIAGNOSIS, AND PROGNOSIS. A STATISTICAL
STUDY.**

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In two former papers I expressed my conviction that thoracic aneurysm is much more frequent than is usually thought. I desire to submit now some statistical studies which confirm this impression. The data shall also serve as a basis of discussion of incidence and diagnosis.

That the diagnosis of thoracic aneurysm is often missed is shown by the frequency in the literature of such titles as:

"A Case of Thoracic Aneurysm without Physical Findings."

"Aneurysm de la Crosse Aortique avec Absence des Signes Stethoscopique."

"Aneurysm; Absence of Physical Signs; Rupture into Primary Bronchus."

"Enormous Aneurysm of Ascending and Transverse Portions of Aortic Arch; Entire Absence of Symptoms: Death from Rupture Into Left Pleural Cavity."

"Sudden Death by Rupture of Thoracic Aneurysm Previously Unrecognized."

"A Case of Aneurysm of the Arch of the Aorta Remarkable for the Almost Total Absence of Direct Physical Signs."

Biggs¹ reports that out of 25 cases of thoracic aneurysms in which rupture occurred a history of suggestive aneurysm was presented by only 11. Draper² has published a similar series of ten sudden deaths by rupture of thoracic aneurysm previously unrecognized. All of which is corroborative of Osler's dictum that "there is no disease more conducive to clinical humility than aneurysm of the aorta."

The material which I have analyzed is from two sources, namely, the out-patient medical clinic of the Touro Infirmary and the autopsy records of the Charity Hospital. In the Touro clinic up to the time the analysis was made last fall (1914) 15,513 patients had been seen by my colleague, Dr. C. L. Eshleman, and myself or our assistants. In this number I have been able to find 47 thoracic aneurysms. That is to say, 0.3 per cent. (or 1 in 300) of

¹ New York Med. Rec., xxxiii, 365.

² Sudden Death by Rupture of Thoracic Aneurysm Previously Unrecognized, Boston Med. and Surg. Jour., 1895, cxxxii, 245.

all patients examined were found to have a thoracic aneurysm. There is no doubt that other aneurysms escaped diagnosis. These figures, extreme as they seem to be, are not as startling as the ones quoted from the Johns Hopkins Hospital by Osler in his Schorstein Lectures, namely, that in 24,363 admissions there were 204 thoracic aneurysms, 0.9 per cent. (or nearly 1 in 100). With this may also be compared the Melbourne statistics of Allen as quoted by Osler: in 46,878 admissions there were 298 aneurysms (of all arteries?). Borowsky² reports from the Breslau Pathological Institute 66 thoracic aneurysms in 19,646 autopsies (0.34 per cent.).

SEX AND RACE. In my series there were 8016 males and 7497 females. The incidence of thoracic aneurysm was as follows: males, 0.43 per cent.; females, 0.16 per cent.; in other words, thoracic aneurysm was nearly three times as frequent in males as in females. This is in accord with all previous records, and is consistent with the usually adopted theories as to etiology. If syphilis, overstrain, and alcoholism are the chief factors in the etiology, we should expect the preponderance of the male sex. On the other hand, the difference between the whites and negroes is not at all marked, contrary to my expectation and contrary to the Johns Hopkins figures already referred to. Osler says: "The ratio of colored to white in the aneurysm series is about 1 to 2.6, while the proportion of white to colored in the wards is 5 to 1." "Incidence of syphilis in the colored population is high, and many of the men have very hard work necessitating sudden effort and strain." The Touro series showed the following:

PERCENTAGE OF THORACIC ANEURYSM.

All patients	0.3
Whites, male and female	0.28
Negroes, male and female	0.34
Males, white and negro	0.43
Females, white and negro	0.16
White males	0.46
Negro males	0.49
White females	0.07
Negro females	0.22

It will be seen, therefore, that much more stress must be laid upon sex than upon race. The females were nearly one-half of the series of patients (8016 males, 7497 females), but furnish only one-quarter of the cases (12 out of 47). The white males furnished more than six times the cases that the white females did and the negro males furnished more than twice as many as the negro females. The negro female cases were relatively three times as frequent as the white female ones, while among the males the aneurysms were about as frequent in white men as in negroes. All of the above

² Die Perforations richtung der Aneurysmen der Aorta Thoracica. Inaug. Dissert., Breslau, 1910.

figures refer to aneurysms of the thoracic aorta. There were no abdominal aneurysms in the series of 15,513 patients. Hall¹ gives a series of 183 thoracic aneurysms admitted to the Westminster Hospital in twenty-four years; of these 160 were men and 28 women. According to Lebert the proportion is 10 men to 3 women.

Further confirmation of the frequency of aneurysm of the aorta is obtained by an analysis of the postmortem material of the Charity Hospital. In the 2000 autopsies held from August 18, 1905, to October 13, 1914, there were found 67 aneurysms of the aorta. In 33 bodies out of each thousand—3.3 per cent.—one body in thirty revealed an aneurysm of the aorta; 50 of these aneurysms were of the thoracic aorta and 15 were abdominal. Two bodies showed both a thoracic and an abdominal aneurysm. One body in 40—2.5 per cent.—revealed a thoracic aneurysm. These figures conform closely to those given by Osler² in his *Modern Medicine* article: 64 cases of aneurysm of the aorta in 2200 autopsies at Johns Hopkins Hospital—2.9 per cent. When we realize the significance of these figures, that 1 patient out of every 300 examined is found to have an aortic aneurysm, and that such a condition is found in one out of every thirty bodies opened, we shall cease to look upon aneurysm of the aorta as a rare disease.

The autopsy statistics are very much the same as those of the Touro out-patient department.

PERCENTAGE OF ANEURYSM OF AORTA.

All patients	3.3
Whites, male and female	2.9
Negroes, male and female	3.7
Males, white and negro	4.2
Females, white and negro	1.1
White males	3.4
Negro males	4.5
White females	1.1
Negro females	1.2

The percentage of the cases varies very little as between race, but very markedly as between sexes. The women are one-quarter of the total number, but furnish only one-tenth of the aneurysms. The negroes are 60 per cent. of the series and furnish 65 per cent. of the aneurysms. The percentage of aneurysms of the white females differs practically not at all from that of the negro females. The difference between the incidence in white males and negro males is somewhat more marked than in the Touro series.

The figures of thoracic aneurysm alone in the Charity Hospital postmortem series are as follows:

¹ Lumléian Lectures on Intrathoracic Aneurysm, *Lancet*, London, March 22, 20 and April 5, 1913, pp. 803, 870, 945.

² *Modern Medicine*, Philadelphia, Lea & Febiger, iv, 508. Article by Osler.

PERCENTAGE OF THORACIC ANEURYSMS.

All patients	2.6
Whites, male and female	2.05
Negroes, male and female	3.04
Males, white and negro	3.2
Females, white and negro	1.0
White males	2.3
Negro males	3.2
White females	1.1
Negro females	0.9

The marked difference in the incidence in males and females is shown in every statistical study in the literature. From these I may instance the following:

		Males.	Per cent.	Females.	Per cent.
Maximoff ⁸ (Munich Clinic)	41 cases	29	71.2	12	28.8
Emmerich ⁹ (Munich Path. Inst.)	58 autopsies	39	67.2	19	32.8
Crisp	390 cases	340	89.5	40	10.5
Maximoff ⁸ (collected from literature)	303	252	84.0	51	16.0
Borowsky ⁴ (collected from literature)	175	150	85.7	25	14.3
Biggs ¹⁰ (New York coroner's inquests)	33 autopsies	25	76.0	8	24.0
Hall ¹¹ (Westminster Hospital)	184 cases	160	85.1	28	14.1
Hall ¹¹ (Westminster Hospital)	98 autopsies	89	90.8	9	9.2
Oswald Browne ¹² (quoted by Hall)	150	132	88.0	18	12.0

AGE. While aneurysm of the aorta is usually a disease of middle life—from thirty-five to fifty-five years—it has been found in every age from infancy to senility. Borowsky in his collection from the literature has noted a case of a female infant, aged thirteen months, who showed at autopsy a thoracic aneurysm. Le Boutilier¹⁴ has reported cases in children, and has gathered all the reported cases occurring in persons under twenty years of age. The oldest patient in Borowsky's report was eighty-seven years. The diagnostic lesson we must learn from this is that the possibility of a thoracic aneurysm is not to be denied in any patient on the score of age. My statistics conform closely in outline to those of other series already on record:

AGE INCIDENCE OF THORACIC ANEURYSM.

Age years.	Lemann's Touro series.	Lemann's Charity Hospital autopsy series.	Rossett-Smith. ¹⁵	Maximoff.	Maximoff from literature.	Borowsky from literature.	Crisp quoted by Borowsky.	Emmerich, quoted by Borowsky.
1 to 10	..	..	..	..	10	1	1	
10 to 20	..	..	..	..	9	2	5	
20 to 30	1	6	13	4	28	11	71	1
30 to 40	15	17	28	4	71	43	198	7
40 to 50	10	20	6 over	14	100	58	129	16
50 to 60	8	9	..	14	50	46	65	16
60 to 70	3	3	..	5	21	10	25	11
70 to 80	..	..	..	..	5	4	8	5
Over 80	..	1	..	..	4	..	3	2
Unknown	1	10	..	..	..	..	..	..

⁸ Beitrag zur Statistik der Aorten, Aneurysmen, Inaug. Dissert., Munich, 1910.

⁹ Inaug. Dissert., Munich, 1888, quoted by Borowsky.

¹⁰ Loc. cit.

¹¹ Loc. cit.

¹² Loc. cit.

¹³ Loc. cit.

¹⁴ Loc. cit.

¹⁵ Loc. cit.

¹⁶ Case of Aneurysm of the Transverse Portion of the Aortic Arch in a Girl of Nine Years, with a Table of Reported Cases under Twenty Years Old, AMER. JOUR. MED. SCI., 1903, cxxx, 778.

¹⁷ Brit. Med. Jour., August 31, 1907, p. 510.

Hall gives the following from autopsy records:

Age at death.	Oswald Brown's figures.	Westminster Hospital.
Under 35 years	24	21
35 to 55 "	97	71
Over 55 "	19	5
Age not given	10	1

LOCATION. I have analyzed my autopsy series also as to the location of the aneurysm. This is important not only from the point of view of accuracy and definiteness of diagnosis, but also from that of prognosis. Such a study may also serve to throw some light upon the fact that so many aneurysms run a latent course, without direct signs or symptoms. Broadbent has directed attention to the fact that aneurysms of the ascending and transverse portions of the aorta are likely to furnish physical signs, such as tumor, pulsation, thrill, bruit, etc., whereas aneurysms of the transverse and descending portions may not present any of these signs while causing by pressure symptoms such as dyspnea, dysphagia, brassy cough, change in voice, etc. Hence his classification into "aneurysms of signs" and "aneurysms of symptoms."

TABLE A.

Location.	Lemann's Charity Hospital series.	Souls (quoted by Richter).	Oswald Brown St. Bartholomew's Hospital	Crisp, Lebert and Myers. (quoted by Hall).	Hall Westminster Hospital.	Bassett-Smith.	Maximoff.	Borowsky.	Richter.
Ascending portion of thoracic aorta	8	58	115	28	7	66	8		
Arch	21	15	75	21	10	43	43		
Ascending and arch	1	..	..	10	..	25	..		
Arch and descending	4	..	..	..	..	..	35		
Descending	9	10	17	49	18	16	..		
Descending thoracic and abdominal	2	..	..	..	..	..	..		
Ascending portion of the thoracic aorta and abdominal aorta	1	18	..	..	..	..	21		
Abdominal	15	5	..	..	10	5	..		
Thoracic, location not definitely stated	6	..	..	..	6 multiple aneurysms	24	..		

It will be seen that the arch is the most usual site. Thus in my series the arch was involved in at least 38 per cent. of all aortic aneurysms and 50 per cent. of all thoracic aortic aneurysms. This latter figure may be compared with the percentages in the largest collection of thoracic aneurysms:

"Summary View of Thirty Cases of Aneurysms of the Aorta from which Death Occurred in City and Country Hospitals of San Francisco, Pacific Med. and Surg. Jour., 1867, N. II., p. 9, reference; 1868, ii, 213; 1870-71, iv, 113.

	Crisp and Lebert, per cent.	Richter, per cent.	Borowsky, per cent.
Ascending	41	10	44
Arch	40	50	29
Ascending and arch			16 } 45
Descending	19	40	10+

DIAGNOSIS. In turning now to a discussion of early diagnosis I do not propose to enumerate and describe all of the numerous phenomena which have been laboriously accumulated as evidence pointing to aneurysm of the thoracic aorta. Rather, I wish to emphasize the fact that if we wait for the complete classical clinical picture of thoracic aneurysm as described in our text-books, we shall miss the vast majority of cases and make a diagnosis in those instances only where the prognosis of the disease is such as to preclude any aid to the patient. I have already alluded to the well-known "latency" of the disease. That our own experience is the same as that of others is shown by the appended table of symptoms in our Touro clinic cases. In order to give these figures their full appreciation, one should remember that both Dr. Eshleman and I have been impressed by the frequency of the disease and have been keenly on the lookout for the pathognomonic signs not only before a diagnosis was made but also after the latter was established; hence when a certain phenomenon is set down as "absent" or "not mentioned" this statement should bear more weight than it would had we not been "searching" for aneurysms as it were.

INCIDENCE OF SYMPTOMS: TOURO CLINIC SERIES.

	Present in cases.	Absent in cases.	Not men- tioned in cases.
Bruit	20	9	18
Tracheal tug	4	16	27
Substernal dulness	33	3	11
Vertebral dulness	15	5	27
Inequality of pupils	4	25	18
Inequality of radials	5	21	21
Unequal sweating	0	0	47
Left recurrent paralysis	6	2	39
Cough	16	5	26
Pain in chest	27	..	20
Pain on pressure over sternum	4	..	43
Pain in right arm	1	..	46
Pain in left arm	7	1	39
Dysphonia	9	1	37
Dysphagia	7	1	39
Diastolic shock	4	14	39
Tumor	6	7	34
Thrill	4	12	31
Pulsation	10	1	36
Wassermann	11	9	27
Tehergunobow modification of Wassermann	10	5	22
Fluoroscope ¹⁷	12	..	35
Roentgenogram ¹⁷	32	1	14
History of syphilis	11	3	33

¹⁷ Our earlier cases were chiefly roentgen-rayed. Many of them were not fluoroscoped. Some of the later cases were examined with the fluoroscope and not roentgen-rayed.

It is noticeable that only two phenomena were present in any considerable percentage of the cases. These were pain and dulness. The importance of pain has been emphasized again and again, but the literature of recent years shows the trend to lay increasing stress upon it. Hewlett and Clark¹⁸ name it as the main symptom, and quote approvingly from Huchard: "When one is dealing with symptoms of pain characterized by their persistency, their long duration, their intensity; when they remain unexplained, when they resist ordinary medication, finally when they present certain special characteristics, such as fixed location, or a diminished severity in certain attitudes of the patient, then we are not dealing with true neuralgia, as is too frequently assumed. In such cases one should consider aneurysm as a probable diagnosis, and if no tumor is perceptible as yet, one should turn to the roentgen rays in order to obtain certain proof." Hall gives the same advice in almost the same words. I have also been able in several of my cases to observe the characteristic attitude which Hall describes: "When he (the patient) is at ease he will sit up in bed with the knees drawn up, arms forward, shoulders slightly raised, and the head bent forward, and he will say that he breathes more comfortably in that position." The distribution of the pain I shall not go into extensively here. Suffice it to say that it may be substernal, vertebral, may extend down either arm or up the side of the neck to the occiput, as noted by Dr. Graham Steele. The pain may be continuous or may occur as typical attacks of angina. The following case from the Touro series illustrates the significance of pain:

CASE.—B. J. H., white male, aged fifty-five years, laborer, hard drinker, applied to the Touro clinic July 22, 1909, for relief of pain in the legs. Beyond an arteriosclerosis nothing abnormal was noted. After several months' treatment he was relieved of these pains. One year later (June 30, 1910) he returned, complaining of terrific pains in the left arm, beginning at the shoulder and extending down to the hand. Pressure over the brachial plexus, over the clavicle, and along the nerve trunks in the arm caused great pain. Dr. Van Wart, in consultation, suggested an intrathoracic cause for neuralgia. There were no evident symptoms of aneurysm. Percussion outline was as follows:

First intercostal space, $3\frac{1}{2}$ cm. to the right of the middle line.

First intercostal space, $5\frac{1}{2}$ cm. to the left of the middle line.

Second intercostal space, 4 cm. to the right of the middle line.

Second intercostal space, 4 cm. to the left of the middle line.

Third intercostal space, 4 cm. to the right of the middle line.

Third intercostal space, $8\frac{1}{2}$ cm. to the left of the middle line.

Fourth intercostal space, 4 cm. to the right of the middle line.

Fourth intercostal space, $8\frac{3}{4}$ cm. to the left of the middle line.

¹⁸ Symptoms of Descending Thoracic Aneurysm. AM. JOUR. MED. SC., 1909, cxxxvii, 792.

Fifth intercostal space, 4 cm. to the right of the middle line.

Fifth intercostal space, 9½ cm. to the left of the middle line.

No dulness posteriorly. Roentgenogram showed dilatation of descending arch of the aorta.

July 7, 1910. Patient spat a little blood.

September 24, 1910. Dulness was found posteriorly 6 cm. to the right of the vertebral column, extending from the first to the fourth dorsal spinous process.

Equally suggestive as pain are the disturbances of sensation, to which Head had directed attention. Hewlett and Clark and also Frick¹⁹ have reported cases with zones on the chest wall of hyperalgesia and sometimes with anesthesia.

PHYSICAL SIGNS. In a previous paper²⁰ I have discussed the importance of percussion. In our hands it has seemed to yield earlier information of an intrathoracic growth than any other method of physical examination. The personal equation is, of course, to be taken into consideration, and each man has his hobby. Dr. Hall alludes to the fact that his series of aneurysms show a larger percentage of involvement of the recurrent laryngeal, and attributes this to the fact that he had been engaged for many years in a throat practice. A large number of cases of hoarseness would naturally come or be referred to him, and, besides, he probably included a laryngoscopic examination in his routine physical examination, which is not usual. In addition there is to be considered his greater skill in noting departures from the normal in the position of the vocal cords. I cannot, however, believe that our percussion findings are peculiar to us. The dulness was always outspoken and required no particular method nor manipulation to demonstrate. It was so often the first and only phenomenon to direct attention to intrathoracic abnormality that I am convinced that if more attention is paid to it in routine physical examinations many "latent" aneurysms will be turned to light. The abnormal dulness to which attention is called may be found in two locations. The first in the region of the manubrium. Normally percussion over the manubrium yields a note that is more resonant than that obtained over the body of the sternum, but yet not fully resonant. It is dull when compared with the percussion note in the second and first intercostal spaces to each side of the sternum. The limits of this relative dulness over the manubrium extending usually to the borders of the manubrium or just beyond, represents, I think, the outlines of the great vessels at the root of the heart, together with such other solid tissues as are normally present. When an abnormality in the anterior mediastinum exists, such as neoplasm,

¹⁹ *Nebe Objective Nachweisbare Sensibilitätsstörungen am Rumpfe bei Aneurysma Aorta.* Wien. klin. Wchnschr., 1901, No. 25.

²⁰ Lemmann, *The Importance of Percussion in the Diagnosis of Thoracic Aneurysm*, Pan-American Surgical and Medical Jour., 1914, vol. i.

enlarged glands, or aneurysm the area of relative dulness is converted into one of flatness, and the conditions are reversed so that instead of the manubrium being more resonant than the body of the sternum it is duller. In addition to this the limits of the flatness (or dulness) are no longer marked by the sternal border, but extend more or less into the first and second intercostal spaces, according to the size and location of the abnormal solid mass in the mediastinum.

The second location of abnormal dulness is over the vertebræ. Various clinicians have from time to time directed attention to percussion over the vertebræ, but it does not seem to have received the universal and routine application it deserves. Under normal conditions, percussion over the thoracic spine yields a resonant note except over the bodies of the first, second, and sometimes the third vertebræ. These are dull. Where dulness extends lower than the body of the third thoracic vertebra there exists some abnormality in the posterior mediastinum. Added significance is lent to this vertebral dulness when there is also paravertebral dulness whether on the one side or the other, but particularly on the left side. The best results are obtained when percussion is performed from below upward, that is to say, proceeding from resonance to dulness. In my Charity Hospital series are several cases in whom I observed antemortem extensive areas of dulness in the upper part of the chest posteriorly, exceeding the size of the aneurysms, large as these latter proved to be postmortem. Two of these cases I reported in my former article, and I repeat here the comment I made at that time:

"The dulness in these cases extended practically across the whole of the upper part of the back down as far as the level of the fifth or sixth thoracic spine, and over this area there was in one case for a while absolutely no respiratory sounds to be heard, and the vocal resonance was markedly diminished. I am not prepared to explain such findings beyond the suggestion that compression of the lungs may account for some of them."

ROENTGENOGRAPHY. The use of fluoroscopy and roentgenography must rank above the usual methods of physical examination on account of the greater accuracy and the sharper definition of the information secured. The roentgen rays take a subsidiary position only in that we are forced by consideration of time and economy to examine only selected cases. To the degree that we make fluoroscopic examination a routine procedure, we may expect to increase the accuracy of our diagnosis and enlarge the number of discovered "latent" aneurysms. Letulle²¹ has proposed and carried out a routine which has proved most successful in this direction. He says: "If we take the trouble, as I have done in my hospital ser-

²¹ *Diagnostic des Aneurismes de l'aorte*, Presse méd. 1913., xxi, 215.

vice for more than three years, to examine with the roentgen rays every chronic invalid, not only those with hypertension and the atheromatous but also all chronic nephritics, all patients with hepatic cirrhosis, tabes, chronic myocarditis, chronic bronchitis (complicated or not with bronchiectasis), and finally the lamentable cohorts of "sclereux pulmonaires," chronic lead victims and old syphilitics, we shall find innumerable diagnostic surprises. In thirty-six to forty months we have been able, my colleague, M. Anbourg and myself, to discover in this way 27 aneurysms of the aorta, all latent."²² Lange made a comparative study of the roentgen-ray findings and the clinical histories of 19 cases in which such histories were obtainable, and was convinced "that if we wait for the appearance of the cardinal signs and symptoms as laid down in the text-books in order to make a diagnosis of aortic aneurysm, the diagnosis in many cases will be made very late and often too late to lend material aid to the patient." Baetjer²³ reports that 5 per cent. of the 104 aneurysms in his series were discovered accidentally by the roentgen rays. I think there is much common sense in Lange's²⁴ argument: "Musser says the roentgen rays should be resorted to in all cases of aortic aneurysm. Osler says the roentgen rays should be used in doubtful cases. But the value of the roentgen rays does not consist in confirming the presence of an aneurysm which is already indicated by one or more of its clinical signs, but the practical value of the roentgen rays to the patient lies in the recognition of small aneurysms and aortic dilatations before any cardinal signs are present." But the fact remains that it is not feasible to subject every patient to a roentgen-ray examination to make the latter a part of our routine physical examination. To adopt at least a part of Letulle's recommendation is, however, practicable and desirable. When we shall cultivate a spirit of suspicion and alertness, as to obscure chest conditions and subject all such to the test of the fluoroscope we shall have made a long step in advance.

PROGNOSIS. As to prognosis the first thing to be noted is that as our diagnostic methods improve and we come to make diagnoses earlier the prognosis will naturally improve. For if the average prognosis of any given disease be ten years while we are recognizing this disease only in an advanced stage it stands to reason that the average prognosis of the same disease even if not treated in any different way will be increased to much more than ten years if we learn to recognize it in an early instead of a late stage. A man whose aneurysm has been recognized by physician A two

²² This did not include a large number of plainly manifest aneurysms diagnosed by the usual clinical methods.

²³ Johns Hopkins Hosp. Bull., 1906, xvii, 24.

²⁴ Some Observations on the X-ray Study of Twenty-five Cases of Aortic Aneurysms, *Lancet-Clinic*, Cincinnati, 1910, ciii, 219.

years earlier than by physician B will be considered by physician A to have run a two year longer course than he will be considered by physician B.

The second point of importance is that, as it is, thoracic aneurysms are of much longer duration than is usually thought. I have had several under observation for five years without observing much if any change in them. Hirsh and Robins²⁵ have reported one case of twenty-five years' duration substantiated by autopsy. Whipman's case lasted sixteen years and Sir W. Gardner's twelve years (both quoted by Hirsh and Robins). Lebert (quoted by Cumston²⁶) gives the following table based on the time from the observation of the first symptoms until death took place:

3 months.	4 cases.
3 to 6 months.	12 cases.
12 to 15 months.	17 cases.
15 to 18 months.	10 cases.
18 to 24 months.	14 cases.
24 to 36 months.	10 cases.
36 to 48 months.	8 cases.
4 to 10 years.	9 cases.

Duration of Life of Patients with Aneurysm. Hall's experience in 35 cases in private practice was as follows: "Excluding all doubtful cases and cases in which I have not been able to trace final results, and excluding also a patient who was alive ten years after I had made a diagnosis of aneurysm, I find that the average duration of life works out a little over two years and eight months." There were 2 cases in which death occurred nine months after the appearance of symptoms suggestive of aneurysm and 1 case in which death was delayed seven years.

The third point in prognosis is that a large percentage of the cases terminate by rupture.²⁷ They therefore constitute an important factor in the number of sudden deaths. The patient with a thoracic aneurysm is in danger of sudden death at any time.

In my Charity Hospital series it would appear that abdominal aortic aneurysms are more prone to rupture than are thoracic aortic aneurysms. Out of 50 thoracic aneurysms 11 were reported ruptured, whereas 10 out of 17 abdominal aortic aneurysms were so reported. Upon this point I have been unable to find any additional data in the literature. The ruptures in the Charity Hospital necropsies occurred:

²⁵ A Case of Aneurysm of the Aorta of Twenty-five Years' Duration, Maryland Med. Jour., 1903, xlvii, 93.

²⁶ The Symptomatology, Diagnosis, and Treatment of Aneurysm of the Thoracic Aorta, Arch. Diag., January, 1913.

²⁷ Hall gives 41 ruptures in 98 cases in one series (41 per cent.) and 8 ruptures in 35 cases in another series (23 per cent.). Browne's figures are 64 ruptures in 160 cases—42 per cent.

	Cases.
Into the esophagus	3
Into the left lung	1
Into the pericardium	2
Into the trachea	3
Into the left pleura	1
Into the right pleura	1
Total	11

According to the large tabulations of ruptures in the literature rupture externally is uncommon. More ruptures occur into the pericardium than in any other direction.

TABLE B.
NUMBER OF CASES REPORTED OR COLLECTED BY

Ruptured into.	Horowsky.	Clap.	Huchard.	Charcote.	Oswald Brown.	Kelynod.	Hall.	Higgs.	Total.
Pericardium	30	36	25	8	11	13	9	16	148
Left pleura	17	10	27	11	20	7	5	3	100
Right pleura	4	7	10	8	8	1	5	1	44
Trachea	16	5	17	3	3	2	12	1	48
Esophagus	15	9	6	3	7	3	6	1	50
Left bronchus	7	1	14	3	7	1	5	1	38
Right bronchus	4	1	3	1	1	1	1	1	8
Both bronchi	1	4	3	1	1	1	1	1	7
Right lung	2	3	1	1	3	1	2	1	10
Left lung	2	1	10	6	1	1	1	1	22
Left ventricle	1	1	1	1	1	1	1	1	3
Right ventricle	1	2	1	1	1	1	1	1	4
Left auricle	1	1	1	1	1	1	1	1	5
Right auricle	1	1	1	1	1	1	1	1	5
Vena cava superior	23	4	3	1	1	1	1	1	31
Vena cava inferior	1	1	1	1	1	1	1	1	1
Pulmonary artery	7	4	3	2	1	1	1	1	18
Mediastinum	4	2	4	1	1	1	1	1	11
Pericardium and right ventricle	1	1	1	1	1	1	1	1	1
Pulmonary artery and right ventricle	3	1	1	1	1	1	1	1	3
Esophagus and right bronchus	1	1	1	1	1	1	1	1	1
Subserous tissue-1	1	1	1	1	1	1	1	1	1
Externally	8	7	8	4	3	3	2	1	35
Total	150	97	133	51	64	32	41	24	592

Thus in 592 autopsies rupture occurred into the pericardium 148 times, equal to 25 per cent; externally only 35 times, equal to 5.9 per cent.

CONCLUSIONS. 1. Aneurysms of the thoracic aorta are not uncommon. Many are "latent" without direct symptoms or signs. They are a frequent cause of sudden death.

2. The first essential to their diagnosis is alertness and an attitude of suspicion in all cases of thoracic pain and of dyspnea.

3. The classical picture with typical signs and symptoms is characteristic only of far-advanced cases.

4. Of all methods of physical examination percussion (of the manubrial region, the first and second intercostal spaces and of the vertebral column) has seemed to me to yield information as to the existence of a thoracic aneurysm at the earliest date.

5. The use of the fluoroscope and the roentgen rays routinely in all cases of persistent chest pain and of dyspnea without apparent cause will reveal many latent aneurysms.

6. The early recognition of aneurysms will probably prove that the prognosis as to duration is much less unfavorable than has been hitherto thought.

AN UNUSUAL CASE OF SO-CALLED PSEUDOLEUKEMIA (LYMPHOSARCOMA).

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As a result of studies being made at the University of Wisconsin and the Milwaukee County Hospital by Bunting, Yates, and their co-workers, the conclusion is being forced upon them that Hodgkin's disease is one of the group of diseases among which are placed leukemia (lymphatic), chloroma, lymphosarcoma, pseudoleukemia, Banti's disease, mycosis fungoides, and certain forms of osteo-arthritis.

We have been on the lookout for a patient showing one or more of these diseases in combination or transformation of one into the other. It was only recently that opportunity was afforded of observing a case which appeared to be typical lymphosarcoma on first admission. Upon readmission, the blood picture was that of acute lymphatic leukemia and glands removed from the axilla just before death showed a picture indistinguishable from the appearance which we believe is typical of Hodgkin's disease. The following is the history, with autopsy and bacteriological findings:

J. T., a Russian, aged twenty-five years, was admitted to the Milwaukee County Hospital September 8, 1914, complaining of swelling of glands of neck, groin, and armpits. There was nothing of moment in the family history. He had always been strong and well, and never had venereal disease. Up to two months before admission he was in good health. About that time he noticed swelling under the angle of the left jaw, followed in a short time by swelling in the left axilla and on the opposite side of the neck. Three weeks after the swellings appeared in the neck he noticed lumps in both groins. There was no pain or discomfort. Recently he had lost some weight.